



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 24.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

[Direct Fastening Technical Guide, Edition 24](#)

To consult directly with a team member regarding our direct fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am - 5:00pm CST.

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## 3.3 CEILING FASTENING SYSTEMS

### 3.3.1 CEILING FASTENING SYSTEMS SELECTION AND DESIGN

#### 3.3.1.1 CEILING FASTENING SYSTEMS SELECTION

The following sections describe suspended ceiling system attachment solutions for lay-in panel or acoustical suspended ceilings. These solutions consist of powder-actuated and mechanical fasteners that provide the installer with highly productive, high quality solutions designed to fit the needs of the particular application.

The primary criterion when determining which solution to choose will depend on the base material. The innovative Hilti X-CX ALH and X-CX C powder-actuated fastening systems are intended for use in concrete and concrete over metal deck base materials. The X-CX ALH is especially well-suited for very hard or tough concrete. The X-CX ALH ceiling clip assembly may also be used in steel base materials. The eye-lag ceiling fastening system is a solution for wood and thin gauge cold-formed steel base materials.



**X-CX ALH Ceiling Clip Assembly**



**X-CX Assembly with Pre-Tied Wire**



**Eye-Lag Fastening System**

#### Hilti Ceiling attachment system product selection guide

Ceiling fastening system	Applicable base material	Fastener types	Recommended installation tools	Wire type	Section
X-CX C	Concrete, lightweight concrete over metal deck	X-C27	DX 351-CT with Pole Tool	Pre-tied to ceiling clip or provided by others	3.3.2
X-CX ALH	Concrete, lightweight concrete over metal deck, steel	X-ALH 22, X-ALH 27, X-ALH 32	DX 351-CT with Pole Tool	Pre-tied to ceiling clip or provided by others	3.3.2
Eye-lag screw	Wood, sheet steel	EL WS, EL S, EL SD	Telescopic Screw Ceiling Tool	Provided by others	3.3.3

### 3.3.1.2 CEILING FASTENING SYSTEMS DESIGN

Figures 1 and 2 illustrate the installation of a suspended ceiling system as described in ASTM C635. The ceiling systems shown are composed of ceiling panels which are supported by a suspension system of main runners, cross runners and wall moulding for direct hung ceiling systems. Carrying channels are part of indirect hung ceiling systems where the main runners are attached to carrying channels which are attached to concrete using Hilti ceiling fastening systems.

The entirety of the suspended ceiling system depends on the Hilti ceiling fastening hangers which support the suspension system main load carrying members. The spacing between ceiling fasteners must be determined by the design architect or engineer of record based on the loads and building code requirements or as recommended by ceiling manufacturer. Hanger wires must be wrapped by the installer to the specific requirements at the point of installation to the main runner or channel members as shown in the figures below.

The wires must be wrapped in a similar fashion at the wire hole for the X-CX ceiling clip assemblies.

Hilti ceiling fastening systems should not be used for anchorage of seismic bracing channels or compression struts. Hilti recommends the use of ICC-ES AC193 qualified mechanical anchors, such as Hilti KB-TZ, for attachment of seismic bracing for suspended ceiling systems. Reference Section 2.4 for more discussion on seismic considerations.

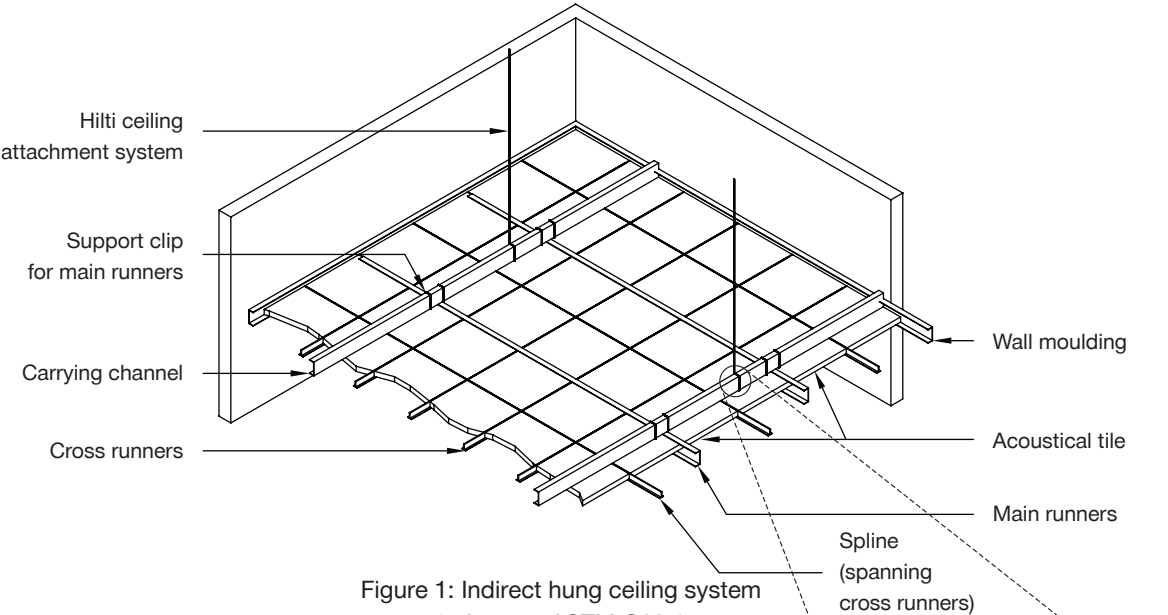


Figure 1: Indirect hung ceiling system (reference ASTM C635)

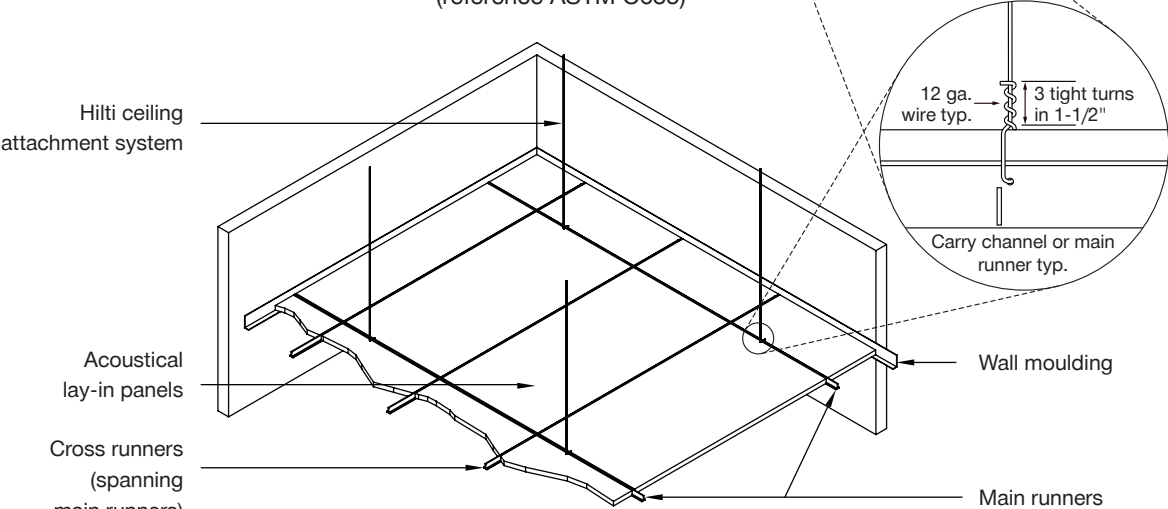


Figure 2: Direct hung ceiling system (reference ASTM C635)

### 3.3.1.3 CEILING FASTENER LOCATIONS WHEN INSTALLING INTO LIGHTWEIGHT CONCRETE OVER METAL DECK

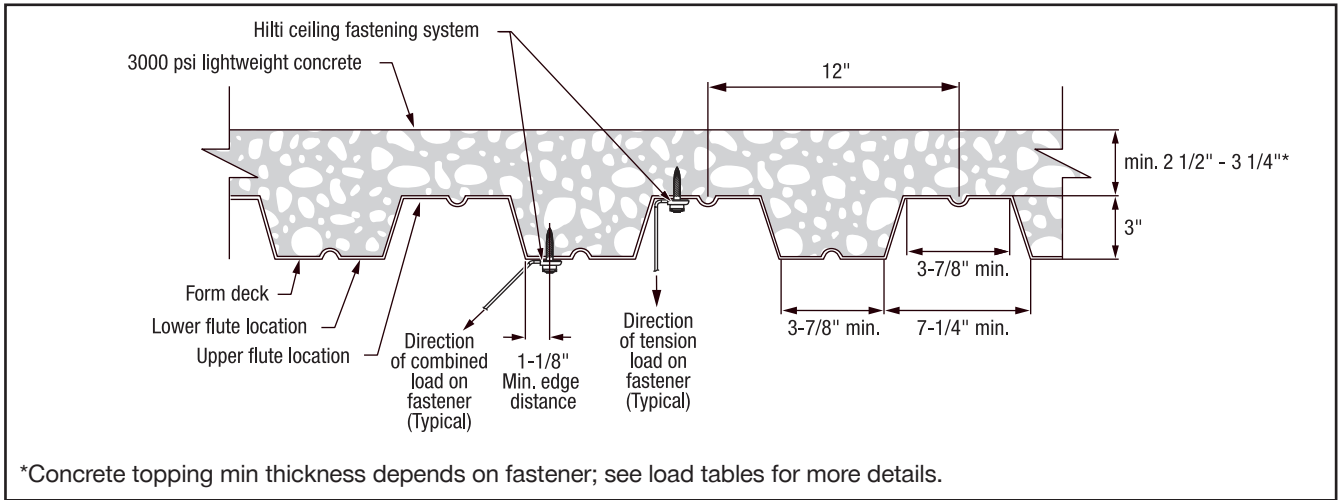


Figure 3: Hilti ceiling fastening system location in 3-in.-deep composite floor deck, normal deck profile orientation